REMARKS

Claims 1-23 are pending and rejected in this application. Applicant has amended Claims 1, 3, 4, 9, 11, and 15-21; and respectfully requests reconsideration and withdrawal of all rejections. Applicant also has included new claims 24-29, and respectfully submits that claims 24-29 are in condition for allowance by the Examiner.

Responsive to the rejection of claims 1, 7, 9-10, 16 and 21-23 under 35 U.S.C. §102(e) as being anticipated by Hu et al. ('631), Applicant has amended claims 1, 9, 16 and 21. Applicant submits that claims 1, 7, 9-10, 16 and 21-23 are now in condition for allowance.

Hu discloses an occupant protection system 10 including an external air bag system 12 and a predictive collision sensing system 14 incorporated in a vehicle 16 for protecting an occupant 18 from injury responsive to a collision (column 1, line 65 through column 2, line 2). Predictive collision sensing system 14 includes a predictive collision sensor 26 having a field of view that is sufficient to see an external object at a distance that is sufficiently far to provide sufficient time deploy external air bag system 12 if predictive collision sensing system 14 would then predict that vehicle 16 and the object are likely to collide at a future time (column 2, lines 8-15). Predictive collision sensor 26 is operatively coupled to a processor 60 having a memory 62. Processor 60 can control the actuation of various gas generator modules 28 and interface with means for sensing an interaction of an inflatable confinement 36 with an impinging object (column 3, lines 53-58). Predictive collision sensing system 14 may provide a measure of the velocity of the object relative to the vehicle (column 4, lines 15-17).

Levine ('895) discloses a vehicle air-bag apparatus for use with an air-bag 8 and a seat 2 within a passenger compartment of a car. A seat position adjusting mechanism movably

connects the seat with respect to the vehicle, and allows the seat to move relative to air-bag 8 between a forward-most position and a rearward-most position. In the forward-most position, a distance between a passenger seated in seat 2 and air-bag 8 is equal to a minimum clearance distance. The minimum clearance distance is the distance between a reference line of a seat-back of the first seat less a predetermined protrusion of an occupant (see abstract).

In contrast, Applicant's claim 1, as amended, recites "a processor . . . configured to . . . determine a likelihood of a collision . . . based upon . . . a calculated future path of the vehicle". (emphasis added).

Hu does not disclose determining a likelihood of a collision based upon a calculated future path of a vehicle. Rather, Hu discloses only that a predictive collision sensing system 14 provides an indication of whether vehicle 16 is expected to collide with an object. This may be based on only a rate of change of the relative positions of the vehicle and the object without regard to the future path of the vehicle, or even whether the vehicle is in motion. Thus, Hu does not disclose or suggest a processor configured to determine a likelihood of a collision based upon a calculated future path of the vehicle, as recited by amended claim 1.

Levine also does not disclose determining a likelihood of a collision based upon a calculated future path of a vehicle. Rather, Levine discloses only adjusting a seat to a safe position without any regard to the likelihood of a collision. That is, Levine does not disclose determining a likelihood of a collision. Nor does Levine disclose calculating a future path of a vehicle. Thus, Levine does not disclose or suggest a processor configured to determine a likelihood of a collision based upon a calculated future path of the vehicle, as recited by amended claim 1.

Applicant's invention, as recited in amended claim 1, includes distinct advantages over the cited references. By considering a calculated future path of a vehicle, a likelihood of a collision can be more accurately determined. For example, the future path of the vehicle is relevant to whether the vehicle will evade the object and avoid a collision. The future path of the vehicle is also relevant to the extent to which a collision may be avoided via processor-controlled braking and/or steering. Lastly, the speed of the vehicle and the radius of curvature of its future path is relevant to whether driver-controlled or processor-controlled evasive maneuvers are possible without causing the vehicle to roll over.

Applicant's claim 1, as amended, also recites "a deployment device in communication with said processor and configured to be installed within the vehicle and to deploy a reversible physical safety countermeasure before the collision occurs if said processor determines that the collision is likely." (emphasis added).

Hu does not disclose deploying a reversible physical safety countermeasure before a collision occurs if a processor determines that the collision is likely. Rather, only an irreversible countermeasure, i.e., inflating confinements, is disclosed. Thus, Hu does not disclose or suggest a deployment device in communication with a processor and configured to be installed within a vehicle and to deploy a reversible physical safety countermeasure before a collision occurs if the processor determines that the collision is likely, as recited by amended claim 1.

Levine also does not disclose deploying a reversible physical safety countermeasure before a collision occurs if a processor determines that the collision is likely. Rather, Levine discloses only adjusting a seat to a safe position without any regard to the likelihood of a collision. That is, Levine does not disclose a processor that determines that a collision is likely.

Nor does Levine disclose adjusting the seat position if it is determined that a collision is likely. Thus, Levine does not disclose or suggest a deployment device in communication with a processor and configured to be installed within a vehicle and to deploy a reversible physical safety countermeasure before a collision occurs if the processor determines that the collision is likely, as recited by amended claim 1.

Applicant's invention, as recited in amended claim 1, includes distinct advantages over the cited references. By deploying a reversible physical safety countermeasure in the event that a collision is likely, it is possible to decrease the likelihood of the collision, such as by applying a brake on the vehicle, or by controlling steering of wheels of the vehicle to avoid the collision, for example. Unlike Levine's action of adjusting the car seat, the reversible safety measures of the present invention would not be deployed unless a crash were likely or at least had a significant level of probability.

Another advantage of deploying a reversible physical safety countermeasure in the event that a collision is likely is that the countermeasure may maximize the protection of the occupant by taking drastic but reversible safety steps that would be impractical or even unsafe if a collision were not likely. For example, the safety belt may be tightened for a few seconds to a degree that, if it were in effect for a long time period, would make the occupant very uncomfortable, or might even prevent the occupant from breathing. However, such an extreme but temporary tightening of the seat belt may minimize the chances or severity of occupant injury during a collision.

For all the above reasons, the cited references, alone or in combination, do not teach, disclose or suggest the subject matter of amended claim 1. Thus, claim 1, and claims 7 and 9-10 depending therefrom, are in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 9 is believed allowable because of its dependence from claim 1, Applicant further submits that claim 9 is also allowable standing alone. Claim 9, as amended, recites in part that "the physical safety countermeasure is configured to at least one of tighten a seat belt on the vehicle, apply a brake on the vehicle, and control steering of wheels of the vehicle." (emphasis added). Tightening a seat belt, applying a brake, and controlling steering are all forms of reversible physical safety measures that are not disclosed by Hu or Levine. Thus, claim 9 is in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 10 is believed allowable because of its dependence from claim 1, Applicant further submits that claim 10 is also allowable standing alone. Claim 10 recites in part "a vehicle movement detector in communication with said processor and configured to monitor movement of the vehicle, said processor being configured to determine a likelihood of a collision between the vehicle and the object based upon data received from the vehicle movement detector." (emphasis added).

Hu does not disclose determining a likelihood of a collision between a vehicle and an object based upon data received from a vehicle movement detector. Rather, Hu discloses sensing the possibility of a collision based upon the velocity of an object relative to a vehicle. That is, the movement or velocity of the vehicle alone is not is not used in determining the likelihood of collision. Thus, Hu does not disclose or suggest a vehicle movement detector in communication

with a processor and configured to monitor movement of the vehicle, wherein the processor is configured to determine a likelihood of a collision between the vehicle and an object based upon data received from the vehicle movement detector, as recited by claim 10.

Levine does not disclose determining a likelihood of a collision. Thus, Levine does not disclose or suggest a vehicle movement detector in communication with a processor and configured to monitor movement of the vehicle, wherein the processor is configured to determine a likelihood of a collision between the vehicle and an object based upon data received from the vehicle movement detector, as recited by claim 10. For the above reasons, claim 10 is in condition for allowance, which is hereby respectfully requested.

Applicant's claim 16, as amended, recites "calculating a future path of the vehicle; determining a likelihood of a collision . . . based upon . . . the calculated future path of the vehicle; and deploying a reversible physical safety countermeasure . . . before the collision and dependent upon said determining step." (emphasis added). Thus, claim 16 recites subject matter substantially similar to the subject matter of claim 1, which is in condition for allowance for all of the reasons given above. Accordingly, claim 16, and claims 21-23 depending therefrom, are also in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 21 is believed allowable because of its dependence from claim 16, Applicant further submits that claim 21 is also allowable standing alone. Claim 21 recites in part "calculating a plurality of factors related to movements of at least one of the vehicle and an object; calculating a decision rating based upon the factors; and comparing the decision rating to a threshold value." (emphasis added).

Hu does not disclose calculating a decision rating and comparing the decision rating to a threshold value. Rather, Hu discloses controlling an inflation responsive to a predicted impact location, a size of an object, and an impact speed. Hu is completely silent as to comparing a decision rating to a threshold value. In step 214 Hu discloses comparing a size of an object to a threshold. However, a size of an object is not a decision rating that is calculated based on factors related to movements of the vehicle and/or the object. Thus, Hu does not disclose or suggest calculating a plurality of factors related to movements of a vehicle and/or an object, calculating a decision rating based upon the factors, and comparing the decision rating to a threshold value, as recited by claim 21.

Levine is completely silent as to any of the steps of claim 21. Thus, Levine does not disclose or suggest calculating a plurality of factors related to movements of a vehicle and/or an object, calculating a decision rating based upon the factors, and comparing the decision rating to a threshold value, as recited by claim 21. Accordingly, claim 21, and claims 22 and 23 depending therefrom, are in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 22 is believed allowable because of its dependence from claim 21, Applicant further submits that claim 22 is also allowable standing alone. Claim 22 recites in part that "the decision rating is calculated as an average of the factors." (emphasis added). Both Hu and Levine are completely silent as to calculating a decision rating as a mathematical average or mean of factors related to movements of a vehicle and/or an object. Thus, claim 22 is in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 23 is believed allowable because of its dependence from claim 21, Applicant further submits that claim 23 is also allowable standing alone. Claim

23 recites in part that "the factors include at least one of an offset from lane center based missed distance, a ratio of projected lateral movement to required lateral movement, a radius of curvature of the vehicle, and a projected Y intercept." (emphasis added). Both Hu and Levine are completely silent as to any of the specific factors recited in claim 23. The Examiner cites column 2, lines 7-15 of Hu as disclosing an offset from lane center based missed distance. The missed distance is the distance from the center of the host vehicle to where the target is expected to be when it reaches the host (emphasis added; page 14, lines 8-9 of the present specification). Applicant submit that Hu is completely silent as to measuring a distance from a center of a vehicle to an object. Thus, claim 23 is in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claims 3-6 and 19 under 35 U.S.C. §103(a) as being unpatentable over Hu in view of Levine, Applicant has amended claims 3, 4 and 19, and submits that claims 3-6 and 19 are now in condition for allowance.

Claim 3, as amended, recites in part "deploy an irreversible physical safety countermeasure before the collision occurs if . . . the collision is likely within a first time period after a present time; and deploy a reversible physical safety countermeasure before the collision occurs if . . . the collision is likely within a second time period after the present time." (emphasis added).

As discussed above with regard to claim 1, neither Hu nor Levine discloses deploying a reversible physical safety countermeasure before a collision occurs. Nor do Hu and Levine disclose deploying an irreversible physical safety countermeasure during a first time period before a collision occurs, and deploying a reversible physical safety countermeasure during a

second time period before a collision occurs. Thus, neither Hu nor Levine discloses deploying an irreversible physical safety countermeasure before a collision occurs if the collision is likely within a first time period after a present time, and deploying a reversible physical safety countermeasure before the collision occurs if the collision is likely within a second time period after the present time, as recited by amended claim 3. Accordingly, claim 3, and claims 4-6 depending therefrom, are in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 4 is believed allowable because of its dependence from claim 3, Applicant further submits that claim 4 is also allowable standing alone. Claim 4, as amended, recites in part that the "irreversible physical safety countermeasure is deployed if a speed of the vehicle is above a threshold speed." (emphasis added). Neither Hu nor Levine disclose deploying a countermeasure if a speed of the vehicle is above a threshold speed. Rather, Hu considers only the relative velocity between the vehicle and the object when deciding whether to deploy air bags. Thus, neither Hu nor Levine disclose or suggest that an irreversible physical safety countermeasure is deployed if a speed of the vehicle is above a threshold speed, as recited by amended claim 4. Accordingly, claim 4 is in condition for allowance, which is hereby respectfully requested.

Claim 19, as amended, recites "each of said step of deploying a reversible physical safety countermeasure and said step of deploying an irreversible physical safety countermeasure being dependent upon a time at which the collision is likely to occur." (emphasis added). Thus, claim 19 recites subject matter that is substantially similar to the subject matter of claim 3, which is in

condition for allowance for all of the reasons given above. Accordingly, claim 19 is also in condition for allowance, which is hereby respectfully requested.

Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Hu in view of Strumolo et al. ('572). However, claim 8 depends from claim 1, which is in condition for allowance for all of the reasons given above. Accordingly, claim 8 is also in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claims 2, 11-15, 17-18 and 20 under 35 U.S.C. §103(a) as being unpatentable over Hu, Applicant has amended claims 11, 15, 17-18 and 20, and submits that claims 2, 11-15, 17-18 and 20 are now in condition for allowance.

Claim 2 depends from claim 1, which is in condition for allowance, and thus claim 2 is also in condition for allowance, which is hereby respectfully requested.

Claim 11, as amended, recites in part "calculating a future path of the vehicle." (emphasis added). As discussed above with regard to claim 1, Hu does not disclose calculating a future path of a vehicle. Thus, claim 11, and claims 12-15 depending therefrom, are in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 13 is believed allowable because of its dependence from claim 11, Applicant further submits that claim 13 is also allowable standing alone. Claim 13 recites in part "monitoring movement of the vehicle." (emphasis added). As discussed above with regard to claim 10, Hu does not disclose a vehicle movement detector for monitoring movement of the vehicle. Rather, Hu considers only the relative velocity between the vehicle and the object when deciding a likelihood of collision. Thus, Hu does not disclose or suggest

monitoring movement of a vehicle, as recited by claim 13. Accordingly, claim 13, and claim 14 depending therefrom, are in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 14 is believed allowable because of its dependence from claim 13, Applicant further submits that claim 14 is also allowable standing alone. Claim 14 recites in part that "the monitoring step includes monitoring at least one of vehicle speed, rate of change of vehicle speed, direction of vehicle movement, and rate of change of direction of vehicle movement." (emphasis added). Hu does not disclose any of the specific forms of monitoring vehicle movement that are recited in claim 14. Thus, Hu does not disclose or suggest a monitoring step including monitoring at least one of vehicle speed, rate of change of vehicle speed, direction of vehicle movement, and rate of change of direction of vehicle movement, as recited by claim 14. Accordingly, claim 14 is in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 15 is believed allowable because of its dependence from claim 11, Applicant further submits that claim 15, as amended, is also allowable standing alone. Claim 15 recites in part that "the deploying step includes at least one of changing a height of a bumper on the vehicle, tightening a seat belt on the vehicle, applying a brake on the vehicle, and controlling steering of wheels of the vehicle." (emphasis added). Hu does not disclose any of the specific forms of safety countermeasures that are recited in claim 15. Thus, Hu does not disclose or suggest a deploying step including changing a height of a bumper on the vehicle, tightening a seat belt on the vehicle, applying a brake on the vehicle, and controlling steering of wheels of the vehicle, as recited by amended claim 15. Accordingly, claim 15 is in condition for allowance, which is hereby respectfully requested.

Claims 17-18 and 20 depend from claim 16, which is in condition for allowance, and thus claims 17-18 and 20 are also in condition for allowance, which is hereby respectfully requested.

Notwithstanding the fact that claim 20 is believed allowable because of its dependence from claim 16, Applicant further submits that claim 20 is also allowable standing alone. Claim 20, as amended, recites in part "monitoring movements of . . . the vehicle." (emphasis added). As discussed above with regard to claim 10, Hu does not disclose a vehicle movement detector for monitoring movements of the vehicle. Rather, Hu discloses only sensing the relative velocity between the vehicle and the object. Thus, Hu does not disclose or suggest monitoring movements of a vehicle, as recited by amended claim 20. Accordingly, claim 20 is in condition for allowance, which is hereby respectfully requested.

Claims 24-29 have been added herein to protect further the patentable subject matter of the present invention. Claim 24, depending from claim 11, recites that the "safety countermeasure comprises a reversible safety countermeasure." (emphasis added). Neither Hu nor Levine discloses deploying a reversible safety countermeasure in response to sensing that a vehicle is likely to be involved in a collision. Applicant submits that claim 24 is in condition for allowance, which is hereby respectfully requested.

Claim 25, depending from claim 11, recites that the "sensing includes calculating a plurality of location coordinates and times of arrival of the vehicle at each of the coordinates." (emphasis added). Such subject matter is described in paragraph [0026] of the present

specification. Applicant submits that the subject matter of claim 25 is neither disclosed nor suggested by the prior art, and that claim 25 is in condition for allowance.

Applicant's new claims 26-29 each recite a respective one of the factors recited in claim 23, which is in condition for allowance for the reasons given above. Accordingly, Applicant submits that claims 26-29 are also in condition for allowance, which is hereby respectfully requested.

CONCLUSION

Applicant believes, in view of the amendments and remarks herein, that all grounds of rejection of the claims have been addressed and overcome, and that all still pending claims are in condition for allowance.

If it would further prosecution of the application, the Examiner is urged to contact the undersigned at the telephone number provided.

The commissioner is hereby authorized to charge any fees associated with this communication and/or credit any overpayments to Deposit Account No. 50-0831.

Respectfully submitted,

Keith J. Swedo

Keith J. Swedo
Reg. No. 43,176
Baker & Daniels LLP
300 North Meridian Street
Suite 2700
Indianapolis, IN 46204
Telephone: (317) 237-0300
Fax: (317) 237-1000
inteas@bakerd.com